



DOE Request for Information (RFI)

Solar Demonstration Zone Project RFI Number: DE-FOA-0000303

Program Manager/Area

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Background and Rationale

The goal of the Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), Solar Energy Technologies Program (SETP), is to make solar energy cost compatible with grid electricity by 2015 and also to enable the high penetration of solar energy in the U.S. electricity market. The near-term goal of the Concentrating Solar Power (CSP) sub-program is to make CSP competitive in the intermediate power market through the development of advanced technologies that will reduce system and storage costs and to otherwise facilitate the deployment of utility-scale solar technologies.

CSP system deployment, however, has been limited by several factors, including the availability of suitable land, environmental restrictions, and access to transmission. The Department of Interior's Bureau of Land Management (BLM) is working to help address these issues through the establishment of 24 Solar Energy Study Areas located on Federal lands in the Southwest.¹ These lands will enable CSP project developers to access favorable sites that have been streamlined for development. DOE is supporting the BLM in this effort.

Even with the availability of Solar Energy Study Areas, projects using more advanced CSP technologies may not be commercialized in a timeframe to meet 2015 and later goals. This is in large part due to the significant amount of capital that is required for a typical CSP project and the reluctance of typical financial sources to provide funding for untested technologies. These barriers are identified as the primary obstacles in preventing commercialization of CSP and other renewable energy technologies.

Without a specific program that can help create a commercialization bridge, it is very likely that DOE program goals for CSP technologies will not be achieved.

¹ More information about the Solar Energy Study Areas can be found at <http://solareis.anl.gov/> and <http://solareis.anl.gov/eis/maps/index.cfm>.

The purpose of the Solar Demonstration Zone Project is to facilitate the development of a cluster of projects in the Southwest that “showcase” advanced new technologies. The technologies should meet a threshold of innovation such as those that have not already been deployed at a commercial scale² in the U.S. Some of the technologies that are anticipated to be considered include high temperature troughs, low-cost thermal storage, low water consuming operations, innovative power conversion cycles, low-cost reflectors, concentrators or heliostats, and concentrating photovoltaic (CPV) systems.

The Solar Demonstration Zone Project will consist of two phases. Phase I will be focused on sub-commercial scale demonstrations of systems using new CSP technologies that will provide technical and financial validation sufficient for these technologies to attract conventional financing. DOE will provide funding with a 50% cost share requirement for these projects. Phase II will consist of commercial scale projects, which will build off of the Phase I sub-commercial scale demonstrations. In addition to conventional financing, these projects may also be eligible for DOE Loan Guarantees and other federal incentives. For both phases, DOE will provide specific site development resources, (e.g. roads, transmission, security, water, etc.), as well as technical assistance and access to high solar resource land. In addition to CSP technologies, other large scale technologies—such as concentrating photovoltaic (CPV) systems—would be eligible for project development through the Solar Demonstration Zone Project.

Proposed Strategy

Through the creation of the Solar Demonstration Zone Project, the Solar Program will support the demonstration of new technologies, providing industry with a clear path to obtaining conventional financing for full-scale CSP projects. DOE is working in cooperation with BLM to designate public lands for development and to obtain access for project development in both phases of this effort. For both Phase I and Phase II, DOE plans to complete an initial environmental assessment—as defined under the National Environmental Policy Act (NEPA)—on these lands, coordinate access to transmission and identify available water permits and the process through which they need to be obtained, in addition to providing financial support for initial project demonstrations.

Phase I

The first phase would be a demonstration at the minimum size needed to provide the technical and financial communities with the level of information to support commercial scale development of systems using advanced technologies. The demonstration size could vary from as small as 1MW for a dish or CPV system, to as high as 10 MW for a trough or tower system. DOE may require the actual size of each Phase I demonstration to be determined based on a

² In accordance with the U.S. Department of Energy Loan Guarantee Program, “Commercial Technology means a technology in general use in the commercial marketplace in the United States at the time the Term Sheet is issued by DOE. A technology is in general use if it has been installed in and is being used in three or more commercial projects in the United States in the same general application as in the proposed project, and has been in operation in each such commercial project for a period of at least five years. The five year period shall be measured, for each project, starting on the in service date of the project or facility employing that particular technology.”

review by independent engineering and financial companies. DOE would provide the site for the demonstration, as well as funding up to a maximum of 50% of project costs. DOE anticipates that an Environmental Impact Statement (EIS) may be required for sites where demonstration projects will be conducted. A preliminary Environmental Impact Statement (EIS) would be conducted on the site by DOE. A project specific Environmental Assessment (EA) may have to be completed and would be supported by DOE as part of the total project cost. DOE will also provide the site access to transmission. It is expected that the projects would begin construction late in FY2011 and, when complete, have a one year operation and evaluation period ending in mid FY2013. Successful Phase I demonstration projects may qualify for Phase II demonstration projects. The criteria for success in Phase I will include the impact of the new technology to lower the levelized cost of power, and to increase the capability of the technology (e.g. storage), and the ability of the developer to obtain a Power Purchase Agreement (PPA) and financing for a Phase II demonstration.

Phase II

On the same site utilized in Phase I, DOE will make a tract of land and associated infrastructure available for larger-scale operational demonstrations of the technologies demonstrated in Phase I. Infrastructure provided by DOE would include appropriate road access, transmission to the site, water and other utilities. DOE would complete the initial EIS under NEPA, but it is anticipated that organizations will be required to complete supplemental EAs under NEPA on a project by project basis. Applicants would be required to obtain their own financing to build the demonstration plant and for individual site infrastructure requirements. Eligible projects would be expected to produce saleable power, and since they would be independently financed, would be eligible for support from other federal programs, including tax credits and loan guarantees. By offsetting infrastructure costs, making transmission access available and expediting land acquisition, DOE expects that projects of this scale would be more easily financeable.

Procurement Concept

DOE envisions issuing a funding opportunity for all types of entities with CSP or CPV systems having the capability to execute a multi-MW project. It is important that the applicants show the potential for executing both operationally and financially a large scale power generating project from both an engineering and construction perspective, or have relationships with such partners to provide this capability in the future.

Solar Demonstration Activities

DOE envisions that the activities of the demonstration plants will prove both the organization's ability to successfully execute a project and operate a plant in a consistent and reliable manner and that the technology performs in an operational environment at the levels and capacity as designed. The DOE National Laboratories will offer a third-party verification of the performance metrics and methodologies.

The intended purpose of these new technologies is to reduce the levelized cost of energy while demonstrating technologies that will be broadly deployable in the current market environment. The current market barriers that these technologies need to demonstrate solutions to include; reducing the technologies environmental impact (including water usage), repeatability and scalability for both the technology and the supply chain to improve overall investor confidence.

Award and Financial Information

Awards under this announcement are anticipated to include the following characteristics:

- Cooperative agreement awards for approximately 4 to 6 demonstration projects, 1 to 10 MW in size.
- Award periods for Phase I will be 3 years. Phase II awards will be made pending evaluation of Phase I project performance.
- DOE fiscal year 2011 funding for all Phase I demonstration projects is expected to be approximately \$50 million. Funding totaling of \$150M is planned through FY2014.
- A cost share of at least 50 percent is required from Applicants.

Request for Information Guidelines

Respondents are asked to comment on the questions below. Respondents are also encouraged to comment on the value of the **Solar Demonstration Zone Project** concept, as well as your organization's anticipated interest in participating in such a program.

Questions

1. What specific technologies will benefit the most from this type of program?
2. Will this type of demonstration program help address the needs of the financial community in order for it to make a loan on a large CSP project (>100MW) incorporating new technology (e.g. cost, hours of operation, size)? If so, what are the appropriate measures by which DOE should select and evaluate projects? What other considerations are required by the financial community?
3. Will this type of demonstration program provide members of the utility industry greater confidence when entering into a PPA with a developer of a large CSP project? If so, what are the appropriate measures by which DOE should select and evaluate projects?
4. What additional activities or support could the DOE lend to this concept to increase its value or success?
5. What services and support, and at what cost, would you anticipate receiving from a national laboratory (e.g. Sandia or NREL)?

6. Should there be a requirement that applications be joint submissions with a utility PPA partner?
7. Are there other specific market, technology or cost barriers that this announcement should have applicants address, such as military conflict, land use, environmental concerns, water availability, or transmission access?
8. What environmental impacts may result from the development of specific technologies?
9. What measures should be put in place to avoid intellectual property conflict and contractual delay in the build out of the demonstration plants?
10. Are there any specific technologies that would not be financeable even if successfully demonstrated?
11. How much time would you anticipate is required to prepare an adequate technical application for the Phase I sub-commercial scale demonstration project?³
12. Would the applicant foresee the Phase I projects being commercially operated for an extended period of time (15-20 years), or used solely for the purpose of the demonstration and then dismantled or used for other purposes?
13. Should DOE charge applicants for land use, water, site management and security (if so – what is a reasonable cost). How should the commercial terms for the revenue generated from the demonstration projects be structured?
14. What level of funding on a cost per MW basis would the applicant expect will be needed to build the Phase I sub-commercial scale demonstration plant?
15. Would it be reasonable to include evaluation criteria of lowest levelized cost of energy? Are there other evaluation criteria that should be included?
16. Should applicants have a power purchase agreement (PPA) as one measure to demonstrate their ability to carry the pilot-scale plant to full-scale? If so, are the timeframes provided reasonable?
17. What MW capacity is appropriate for the pilot-scale projects to demonstrate technology and operational performance? What scale-up factor is anticipated that would enable the technology to be financed by that demonstration?

³ The proposal should provide technology R&D information including methodologies, testing results and principal investigator credentials. The proposal should also include detailed bill of materials and cost estimates for both the pilot phase and proposed pathway to full-scale cost reductions. A Solar Advisor Model analysis using the cost numbers from the detailed full-scale proposal must be provided to give indication of levelized cost of energy of the full-scale demonstration of the new technology. Standard financial assumptions will be given, but some variance to those assumptions should be considered depending on the relative maturity and perceived risk of the technology.

18. Are there any suggestions regarding the operation of infrastructure supporting the Phase I sub-commercial scale demonstrations? Should the DOE explore the use of a common power block to which several of the Phase I projects feed super-heated steam?
19. Should the applicants be required to submit a full-scale application along with the pilot-scale application?
20. Should only Phase I applicants be eligible to submit applications for Phase II?
21. Is the timeline for Phase I appropriate? Will the Phase I timeline provide sufficient operating experience to support financing for the Phase II demonstration?
22. Would a competitive lease option be appropriate for Phase II projects?

DOE will not pay for information provided under this Request for Information (RFI) and there is no guarantee that a project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives.

A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed. DOE may also decide at a later date to issue a Funding Opportunity Announcements (FOA) based on consideration of the input received from this RFI or to not issue an announcement at all.

Respondents are requested to provide the following information at the start of their response to this RFI:

- **Company/Institutional Name,**
- **Company/Institutional Contact,**
- **Address, phone number, and e-mail address,**
- **Brief description of the operations and mission of business or institution (several sentences will suffice).**

All responses to this RFI must be delivered electronically in **Microsoft Word (.doc) format as an attachment to an email** sent to the following email address: cspdemonstration@go.doe.gov Emails should have the subject line **“Solar Demonstration Zone RFI Response”**.

Responses to this RFI must be submitted by 11:59 pm Eastern Time on April 2, 2010.

Responses should be limited to 5 pages. However, more than one response is allowed per respondent. **Please identify your answers by responding to a specific question if possible.** We welcome other comments as well. Identify these additional comments to an item in the RFI which will facilitate aggregating all the responses. Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for program planning and procurement strategy development. Information or data that is restricted in any way or

limited for use by the Government is not solicited and will not be considered. Responses will not be considered confidential. **Please do not respond with any information you deem proprietary or confidential.**

DOE has no obligation to respond to those who submit comments, and/or give any feedback on any decision based on the comments received, as there is potential for a future Funding Opportunity relative to this subject.

This is a Request for Information (RFI). DOE may or may not issue a Funding Opportunity Announcement (FOA) as described herein.

DOE thanks you for your assistance and comments in helping build the solar energy industry in America.